HR1000 USER MANUAL

Version 2.6

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1.0 Installation

The HR1000 is a precision electronic instrument and requires careful handling. It should be ideally installed in a dry atmosphere away from direct sunlight.

The HR1000 and the loadcell cable should be kept well away from any source of electrical noise. The loadcell cable should be kept as short as possible.

1.1 Power Supply

The HR1000 may be powered by the supplied adapter :

Other battery options are available, consult Advanced Micropower Ltd for futher details.

1.1.1 AC Adapter

Important Note : The AC adapter is NOT waterproof, and must NOT be used in a damp environment.

The AC adapter supplied provides 9 Volts at 300mA current. The end of the lead has two soldered wires. The polarity of the wires is as follows :

Black lead only	-	Negative (left)
Black lead with white tracer colour	-	Positive

It must be ensured the power is connected with the correct polarity.

The wire goes through the appropriate cable gland and directly to a two way terminal block on the printed circuit board.

There are NO user serviceable parts contained within the unit. Live parts are enclosed. In the event of a failure return the unit to Advanced Micropower Ltd.

1.2 Loadcell Connections

The loadcell connection is as follows : (from left)

1.	Loadcell positive signal	-	SIG+
2.	Loadcell negative signal	-	SIG-
3.	Loadcell positive sense	-	SEN+
4.	Loadcell positive exitation	-	EX+
5.	Loadcell negative sense	-	SEN-
6.	Loadcell negative exitation	-	EX-

The loadcell wire goes through the appropriate cable gland and
should go a single turn through the supplied ferrite core and then to the four way terminal block on the printed circuit board.

Note: Simply passing through the ferrite is NOT correct.
Figure 1 above shows the loadcell connector :

1.3 LCD Contrast

The contrast on the LCD display can be adjusted by varying a trimmer pot on the printed circuit board.

The location of the (black) trimmer pot is shown on figure 1 above.

The contrast may need to be adjusted for optimum viewing angle depending on the HR1000 mounting position.

1.4 Indicator Mounting

Two brackets allow the HR1000 to be table or wall mounted.

2.0 User Operation

The front panel keys are described below:

ON This key turns the power to the HR1000 ON

OFF This key turns the power to the HR1000 OFF

TARE This key sets the tare deduction.

If tare is required the desired weight should be placed on the scale and the tare key pressed.

Once tare is not required the tare key should be pressed with the scale empty.

ZERO This key sets the scale to zero.

If the zero point has drifted pressing the zero key will correct it.

The zero key is only operational within a small range of the calibrated zero point.

Zero will not be operational if a weight is on the scale and the display will show **Zero Err**.

2.1 Auto Zero Tracking

The HR1000 will monitor the slow drift of the zero point and automatically track and compensate for this error. This feature will only be operational when the displayed weight is close to zero and the weight remains stable for ten seconds.

3.0 Calibration Overview

To enter calibration mode the following sequence is necessary :

1. Hold in both the ZERO and TARE keys during power on.
   The display will show : **Cal 1**

2. Press and release the TARE key within 3 seconds
   The display will now show : **Cal 2**

4. Press and release the ZERO key within 3 seconds
   Calibration mode will now be entered and the display will
   typically show : **F00030.0**

Any incorrect keypress OR delay in pressing the keys will cause the indicator to enter normal weighing mode.

Once in calibrate mode the first character will be flashing, The TARE key will step the display on to the next parameter.

If the TARE key is pushed a number of times the following typical displays will appear :

F00030.0
S00005.0
R000.010
Gain 4
B1778023
Z1463453
S2437325
F i l t 8
Exit Cal

The following is a brief description of the displays :

F00030.0 This is the **F**ull scale value which the HR1000 can display. In this case 30.0 Kg

S00005.0 This is the **S**pan value to be used for calibration. In this case 5.0 Kg.

R000.010 This is the desired **R**esolution of the indicator. In this case 10 grams.

Gain 4 This is the Gain of the HR1000 loadcell amplifier.

B1778023 This is the current value (in bits) of the A to D converter, and dynamically changes when the scale load is varied.

Z1463453 This is the A to D converter bits which currently represent the calibrated zero point.

S2437325 This is the A to D converter bits which currently represent the calibrated span point.

F i l t 8 This is the filter setting of the system.

Exit Cal This gives the user an option to exit the calibration mode.

3.1 Variables

The FULL SCALE, SPAN and RESOLUTION variables can be set as desired in the following way :

1. Use the TARE key when the first character is flashing to select the desired parameter to be modified.

2. Press the ZERO key to go into edit mode for the selected parameter. At this stage the digit to be modified will be underlined .

3. While in edit mode press the TARE key to increment the underlined digit.

4. When the digit is correct press the ZERO key to select the next digit to be modified.

5. The ZERO key may be pushed until the first digit flashes again. The ZERO key will now re-enter the edit mode while the TARE key will step on to the next parameter.

3.2 Gain

The A to D converter has a front end amplifier which has a programmable gain which may be set by the user.

When the Gain variable is selected with the TARE key the ZERO key can now be used to select the desired gain. The possible gains are 1,2,4,8.

For optimum performance the gain should be set as high as possible, but care should be taken that the full load signal does not cause the A to D bits to saturate. This may be checked by looking at the bits display (Bxxxxxxx).

For most common loadcells with a sensitivity of 1 or 2 mV/V a gain of 4 or 8 is usual.

3.3 Filter

The weighing system can have various levels of filtering to suit different applications. The filter settings can be set by the user.

When the Filter variable is selected with the TARE key the ZERO key can now be used to select the desired filter setting. The possible settings are 1,2,4,8,16.

A filter setting of 1 will provide a very fast response, and may be used for fast check weighing applications with static scale platforms.

A filter setting of 16 will provide a very slow response, and may be used for applications where there is a lot of vibration on the scale platform.

A filter setting of 2 or 4 gives good general performance.

3.4 Calibration

Once all variables are correctly set as described above the calibration sequence may be performed in the following manner :

1. Use the **TARE** key to step to the Z display (Zero bits)
2. Ensure no weight is on the scale
3. Press the **ZERO** key to register the new zero point
4. Use the **TARE** key to step to the S display (Span bits)
5. Put the desired span weight on the scale
6. Press the **ZERO** key to register the new span weight
7. Use the **TARE** key to step to the Exit Cal display
8. Press the **ZERO** key to return to the weighing mode